

CHAPTER 1

MEDIUMS

Overview

Introduction

Mastering the basic mediums of pencil, pen and ink, charcoal, pastel, and pigments is still the prerequisite for success as an Illustrator Draftsman. Indeed, for many, the appeal of the DM rating has everything to do with the tactile element of the more traditional media. Even if you work primarily with computer-generated imagery, you are expected to know the visual impression given by different media over various surfaces, blending techniques, and reproduction and presentation limitations.

Objectives

The material in this chapter enables you to do the following:

- Differentiate between continuous-tone pen and ink drawings and line rendering.
 - Select a medium based on the intended creative statement.
 - Select a paper appropriate to the desired media.
 - Recognize the versatility of various media.
 - Distinguish between oil-based, water-based, and polymer-based pigments.
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Overview, Continued

Acronyms

The following table contains a list of acronyms that you must know to understand the material in this chapter.

Acronym	Meaning
B	Lead Softness
CP	Cold Pressed
H	Lead Hardness
HP	Hot Pressed
PSI	Pounds-per-Square Inch

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Overview, Continued

In this chapter This chapter covers the following topics:

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Papers

Introduction

The paper you select for your artwork is important. Give the process of selecting a paper as much thought as you do the subject matter, media selection, and reproduction process. There are too many types of paper available to discuss each in detail, but there are some common features and general truths. To develop comprehensive knowledge on paper make-up and surfaces, contact a manufacturer. Paper companies are generous with paper samples, and swatches upon request.

Paper products

In general, paper products are made from the pulp of trees. Fiber is ground into pulp and chemicals and synthetics are added that affect the strength and durability of the final sheet of paper. These acidic chemicals cause deterioration and discoloration, a process called foxing. A deteriorating paper accelerates the breakdown of other papers in contact with it. High quality papers contain rag or cotton fibers. The three categories of paper are rag paper, a combination of wood pulp and rag, and wood pulp papers. If you are looking for permanence in a mat board or illustration board, select a paper with a neutral-ph rate or archival quality high rag content. Archival quality papers cost more but the acidity of the chemicals is neutralized or removed.

Paper quality

Use quality paper for your artwork. Quality refers to the paper surface, rated durability, and the ability of the paper to perform or accept particular media. Quality papers are stamped or pressed with a watermark indicating rag content. A watermark is a mark made by manufacturers to identify a line of their product. A watermark is visible only when you hold the paper against light.

Paper weight

The weight of paper usually, but not always, refers to thickness. The thickness of paper is determined by how much a ream (500 sheets) of that size paper weighs. For example, 300-pound watercolor paper means that 500 sheets of that paper weighs 300 pounds total. A sheet of 200-pound watercolor paper of the same size (dimensions) would be a thinner sheet of paper, and therefore would weigh less.

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Papers, Continued

Paper size	Paper is manufactured in industry standard sizes. Countries that use the metric system of measurement have different standards than the United States. If you buy paper outside the government supply system in a foreign country, make sure you understand its unit of measure before you order.
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Paper surfaces	<p>Paper surfaces range from slick to rough. Some papers have a right and wrong side or two different surface textures. An excellent paper surface contributes to the professional appearance of an end product. Paper receives a surface as it passes through manufacturer's surfacing rollers when the paper is either cold or hot. Hence, the terms cold-pressed (CP) and hot-pressed (HP).</p> <p>HOT-PRESSED PAPER: Hot-pressed paper has a smooth surface. Also called plate-finish or high-surfaced, this is the family of paper you should select to do tight renderings in pen and ink, most calligraphy, and art intended for reproduction. Hot-pressed paper is not a good choice for pencil, pastels, or any media that requires roughness to deposit pigment. Hot-pressed paper is less absorbent and more dense than CP paper.</p> <p>COLD-PRESSED PAPER: Cold-pressed paper has a medium to rough surface. The roughness of the surface is called tooth. Papers with tooth will break up most strokes. The rougher surfaced papers such as coquille board break strokes up enough to have the resulting art photographed as line drawings. Papers with rough surfaces do not reproduce halftones well. Cold-pressed paper can present lighting problems when you use them for art intended for photographic reproduction. Most general drawing and practice pads and newsprint are made from cold-pressed paper. CP paper is more absorbent, therefore, more affected by humidity than HP paper.</p>
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Humidity	Paper is affected by humidity and dryness. Paper surfaces absorb moisture from the air making the surface soft and easily scarred. The paper will be limp and tend to wrinkle and curl. Heavy-handed pressure on paper during a humid day scores or gouges the paper surface. Dry air dries paper out. It becomes brittle and creases easily.
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Papers, Continued

Paper types

Before you select a paper, choose the media. Papers suitable for one media are not suitable for another. Briefly, here is a general list of papers you will find in Navy graphics shops and their intended uses.

STENCIL BOARD: A cheap, low quality, oil-soaked board intended for use as a stencil and thrown away. Stencil board is oil soaked to resist saturation from both oil- and water-based pigments and strong enough to withstand rough handling. Stencil board is not suitable for illustrations or paintings and over time will stain any other item it touches.

GOLDENROD: Goldenrod provides rigid support for negatives stripped together as a page before exposure as a printing plate. Goldenrod is golden orange in color and has a grid. Paper size corresponds with plate dimensions of the printing presses.

SARAL PAPER or CARBON PAPER: Saral paper is an image transfer paper available in various pastel hues. Carbon paper is an image transfer paper available in blue or black. These papers are similar in their ability to transfer images; however, saral paper erases easier than carbon paper.

SCRATCHBOARD: Scratchboard is a hot-pressed illustration board with a gesso-coated (chalk) surface covered by a dense black pigment. You draw on it by using a set of scratching knives to produce a white line on a black background. The resulting art resembles a woodcut or linoleum engraving.

TRACING PAPER (VELLUM): Rag content (cotton fiber) determines the quality of tracing paper or vellum. Tracing paper and vellum may be transparent or translucent, bright white or dull blue, and plain or gridded. Tracing paper takes ink and pencil well; however, large areas of opaque ink will curl the paper when the ink dries. The primary purpose of tracing or vellum is in technical drawing, drafting, and viewgraph production using diazo processes.

COATED STOCK: Paper or illustration board has a smooth and glossy coated surface. Coated stock is ideal for fine ink drawings and illustrations where a smooth surface is desirable.

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Papers, Continued

Paper types (Continued)

CANVAS BOARD: Canvas board is thick illustration board covered with light canvas and sized with gesso to accept oil and acrylic paints. This board performs in every way like canvas.

NEWSPRINT: Newsprint paper is a cheap, high pulp content paper ideal for drawing and sketching. Newsprint discolors rapidly and crumbles as it ages. Do not choose newsprint for permanent or file drawings and master art. Newsprint is ideal for thumbnail sketches or warm-up exercises before you begin drawing.

PASTEL PAPER: Papers for pastel drawings have a coating of marble dust or pumice to trap pigment. Select surface textures according to your preference. Very fine pastel papers are called velour canvas. Most pastelists prefer a pastel colored pastel paper over white to unify the pastel drawing and intensify the pastel colored pigment.

CHARCOAL PAPER: Charcoal paper is a toothy paper with high absorbance used for drawings made with charcoal or dry pastels. Charcoal clings to the paper and smears less than on smoother paper.

WATERCOLOR PAPER: Paper used for watercolor painting has greater absorbance than papers made for illustration. Choose watercolor paper carefully. Surface texture shows through a true (transparent) watercolor medium. Select a paper that is 100% rag and white. The three general surfaces available in watercolor paper are rough, medium (CP), and smooth (HP). Different weights are available to suit your preference.

ILLUSTRATION BOARD: Illustration board is a stiff board with a portion of rag content that increases with the rated quality of board. The surface texture of illustration board varies. Illustration board is suitable for all media and medium or high quality boards offer some degree of permanence.

MAT BOARD: Mat board is used to surround images with complimentary borders and to protect images from fingerprints and contact with other surfaces. Mat board has some rag content and is available in archival quality. The surface of mat boards have uniform laid or woven textures. Use the texture of mat boards creatively when you draw in charcoal or pastels.

Erasers

Introduction

Everyone makes mistakes. You can imperceptively correct your mistakes if you know the correct eraser for the media. Poor erasures stand out.

Types of erasers

There are erasers you use by hand, electric erasers, and air erasers.

Hand-held erasers

You can use hand-held erasers to remove nearly any stray mark or error if you erase carefully. Hand-held erasers are available in different grades, each with a specific purpose.

SYNTHETIC ERASERS: Synthetic erasers are a new breed of erasers that are soft and nonabrasive. Used primarily on Mylars and vellums, they are not suitable for papers and dark marks. Moisten white synthetic erasers slightly before using them on Mylar. They are often bright white in color, but manufacturers have been producing them in wild array of colors. Synthetic erasers are made of nylon or plastic.

HARD ERASERS: Hard erasers have a lot of abrasive grit in their composition. You can feel the roughness when you drag your finger across the surface. Hard erasers act like sandpaper against paper fibers to remove unwanted marks. They are light grey or dull white in color. Although hard erasers remove dark marks, they tend to disrupt paper fibers making the erasure visible.

INTERMEDIATE ERASERS: Intermediate or moderately abrasive erasers erase most errors with little or no damage to surrounding paper surface. They are medium green or dark pink in color.

SOFT ERASERS: Soft erasers are used for light errors and stray marks, blending, and highlighting. Soft and pliable, the colors of these erasers are light green or light pink in color.

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Erasers, Continued

Hand-held erasers (Continued)

SPECIAL-PURPOSE ERASERS: Special-purpose erasers include art gum erasers, kneaded erasers, and pulverized eraser particles. The super-soft art gum eraser does not damage paper surfaces, but it will leave a crumbly residue. Art gum erasers are light beige. Kneaded erasers are light blue or light grey with the consistency of putty. This malleable substance absorbs graphite and pigment particles. Absorption increases by kneading these erasers in your hand. Generally, these erasers leave no residue unless they are too old or too full of absorbed particles. If these erasers become too warm, the substance may break down, leaving stains on drawing surfaces. A kneaded eraser hardens as it ages. Kneaded erasers are used for blending and for highlighting in drawings made with pencil, pastel, and charcoal. Pulverized eraser particles are nonabrasive and remove only the softest of stray marks. They are often used to clean smudges and smears from already completed drawings. They are available in a can to pour on a drawing, rub, and brush off. They are also available in an ABC pad which is a soft mesh bag full of particles that you rub against the drawing surface and brush off the residue.

The following table shows the types of erasers common to a work center.

Eraser	Purpose	Color	Remarks
Synthetic	Pen and pencil marks on Mylar or vellum	White, amber, and a host of bright colors	Moisten eraser before using, leaves no residue
Hard	Dark pencils marks and light pen marks	Grey and red	Abrades paper surface, leaves no residue
Intermediate	General pencil marks	Medium green and dark pink	Leaves little or no residue
Soft	Light pencil marks, smudges, clean-up, and highlighting	Beige, blue, dark grey and light pink	May leave a crumbly residue

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Erasers, Continued

Electric erasers Electric erasers are hand held units with power cords or rechargeable bases. They provide rapid and thorough erasures. The eraser nib is interchangeable depending on the degree of hardness you require to erase the medium.

To use an electric eraser, follow this table:

Step	Action
1	Select the appropriate eraser nib for the media you are using.
2	Secure the nib into the shank of the electric eraser.
3	Isolate the unwanted area or protect surrounding areas with an erasing shield.
4	Turn on the eraser and lower over the error.
5	Move the eraser in a circular motion over the erasure taking care not to hesitate in one spot for long. Allowing the eraser to sit in one spot too long will bore a hole through the paper and bum the vinyl table covering.
6	Remove the eraser from the drawing surface.
7	Brush away the residue with a draftsman's brush.

Figure 1-1 shows silhouettes of popular electric erasers.

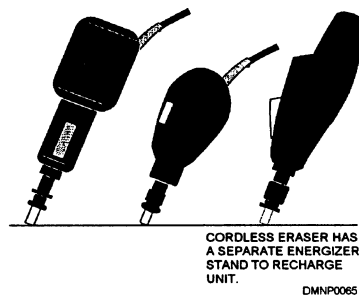


Figure 1-1.—Electric erasers.

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Erasers, Continued

Air erasers

Air erasers are air powered. The principle of operation is similar to that of sandblasting. Isolate unwanted areas and protect the rest of the drawing by masking with a frisket or masking tape. With a special airbrush and a compressor, eraser particles are shot at 35 pounds-per-square inch (PSI) at the drawing until the erasure is complete. You cannot use an airbrush intended for pigments because the size and nature of the abrasive grit will ruin the delicate parts of an airbrush intended for pigment.

Pencils

Introduction

The pencil is the most versatile and expressive media available to you. You can create a range of values from the subtlest grey to the richest black in a variety of line resolutions. For extended study in the versatility of the pencil or the pencil as a finish medium, review the work of contemporary artists Paul Calle and Gene Franks.

Selection

The selection of a lead pencil depends upon your personal preference and the intended end product. Your sensitive manipulation and pressure on the pencil controls the tones you produce. How you sharpen and hold the pencil determines the textural effects obtained and the size of the stroke. Pencil leads are available in 17 grades from 6B, the softest, to 6H, the hardest.

Figure 1-2 shows a chart of lead hardnesses and their applications.

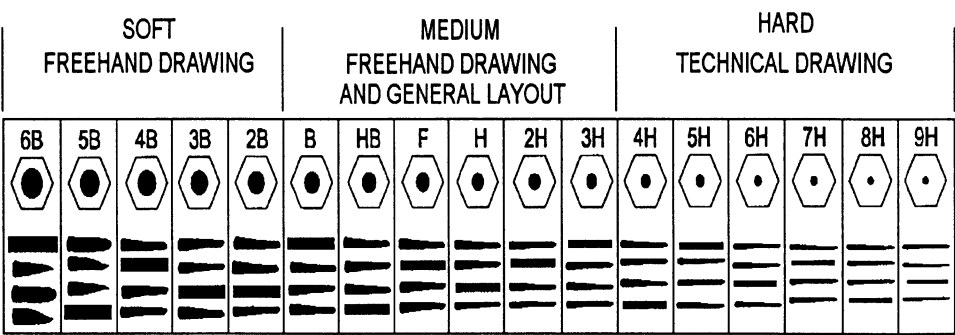


Figure 1-2.—Lead hardness.

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Pencils, Continued

Soft leads	Soft leads, that is, leads in the 6B to 2B range, are well suited to freehand drawing. They tend to be thick in core diameter and leave some graphite residue. Illustrations in soft lead tend to smear easily. Smearing and smudging are creative options with soft leads. Use kneaded erasers to bring out illustration highlights. When used on paper with pronounced grain or tooth, soft leads appear granular and black. Soft lead pencils are brittle and require more frequent sharpening than hard leads.
Medium leads	Leads in the range of B to 3H are medium hard leads. Ideal for general purpose layout work, they are dense enough to leave an image and easily erased. Graphite residue is minimal and the illustration has a light sheen to the surface.
Hard leads	Technical drawing and drawings that require a high degree of precision are done by hard-leaded pencils in the 4H to 6H range. Hard-leaded pencils have small diameter cores and hold points longer than soft leads. The lines appear light and have a high sheen. Heavy pressure on hard-leaded pencils creases the paper and is difficult to thoroughly erase.
Humidity	Humidity affects the graphite core of lead pencils. On dry days, the pencil leaves more dust or residue than on days of high humidity. On damp days, pencil lines appear more black or dense. When continuing a pencil drawing on a day of high humidity, you may have to select a lead that is a few degrees harder than the lead you would use on a dry day.
Variation	You may find that as you master the medium of the pencil, you may increase the selection of pencil leads at your disposal.

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Pencils, Continued

Holding the pencil

Hold your pencil comfortably and naturally. Grip the pencil lightly. To draw light lines, use little pressure. To draw heavier lines, increase pressure. Create texture by changing the angle of the pencil to the paper surface and use the point or side of the lead. Generally, the two ways of holding a pencil are the normal writing position and under the palm. In the normal writing position, you have control for tight or small details. Holding the pencil under the palm allows you to use free-flowing wrist or arm action to draw larger or to draw with less restriction.

Figure 1-3 shows the two ways of holding a pencil.

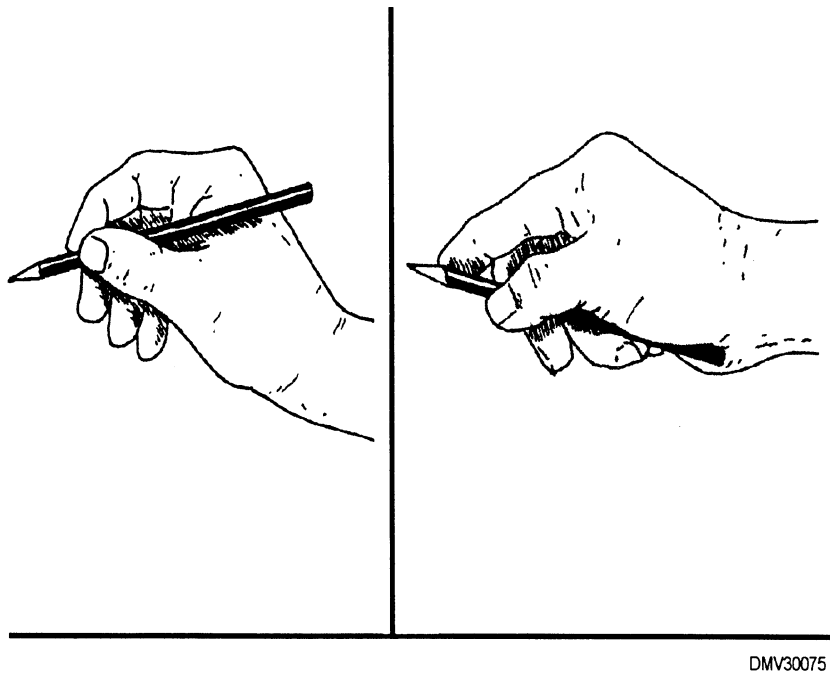


Figure 1-3.—Holding a pencil to draw.

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Pencils, Continued

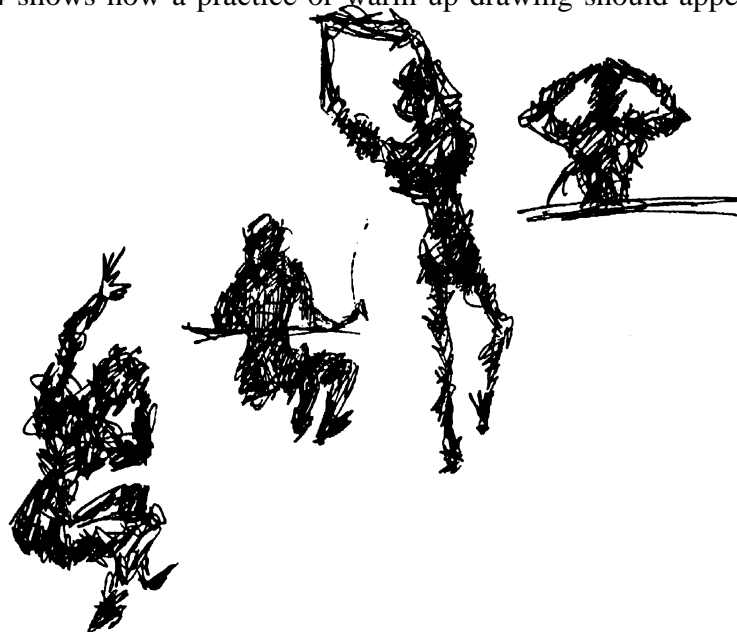
Position of the arm and body

One of the tendencies of novice illustrators is to curl up and form a compact, tight position between the arm and the torso before starting to draw. The drawings you produce from this position also tend to be tightly rendered and small. This position often leads to an overworked drawing. It takes a concerted effort to open up your stance and allow your arm freedom of movement.

Warm-up exercises

Warm up your arm and hands with a few simple, quick exercises. Select a large pad of paper and a crayon. Draw mass areas only, no details. Use a timer set for 30 seconds, select a subject in the room like a chair or a DM3 and begin to draw. At the end of 30 seconds, switch views or positions. Do this for 3 minutes. Now set the timer for 3 minutes. Draw. Repeat this three times. You should now be sufficiently prepared to begin seriously drawing. This is also a good exercise to practice at shopping malls where there is a large variety of subject matter.

Figure 1-4 shows how a practice or warm-up drawing should appear.



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Figure 1-4.—Practice drawings.

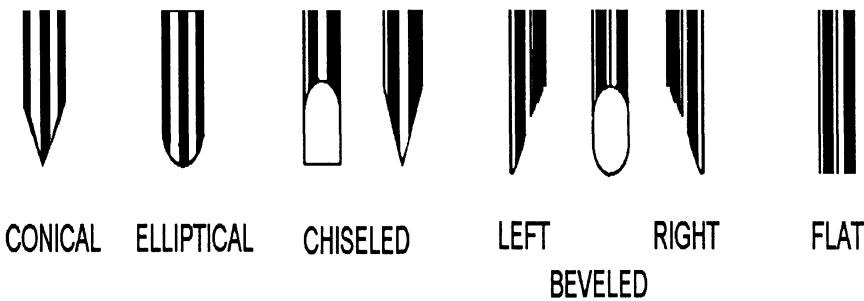
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Pencils, Continued

Sharpening a pencil

The shape of the pencil lead defines the textural quality and the stroke width of the line you draw. A pencil lead may be conical, elliptical, chiseled, beveled left or right, or flat in shape. Softer leads require sharpening more often than hard leads. Three sharpeners used to sharpen pencil leads are regular office sharpeners, draftsman’s sharpeners, and sandpaper pads.

Figure 1-5 shows the shapes of pencil leads.



DMV30089

Figure 1-5.—Shapes of pencil leads.

Continued on next page

Pencils, Continued

Regular office pencil sharpener

The regular office pencil sharpener sharpens the pencil lead to a conical point. It both shaves away the wooden casing and shapes the lead core. Although a conical point is excellent for drawing thin, precise lines, you must maintain point consistency by sharpening often.

Draftsman's pencil sharpener

Unlike the regular office sharpener, the draftsman's sharpener does not shave away the wood case around the lead core. The draftsman's sharpener shapes only the lead. Expose the lead core approximately 3/8 inch by either cutting away the wood with a knife or releasing the lead from the mechanical pencil handle. Insert the lead into the draftsman's pencil sharpener and rotate the sharpener top. This contacts the pencil lead with a replaceable sandpaper tube inside the sharpener and creates a conical point.

Figure 1-6 shows a draftsman's pencil sharpener.

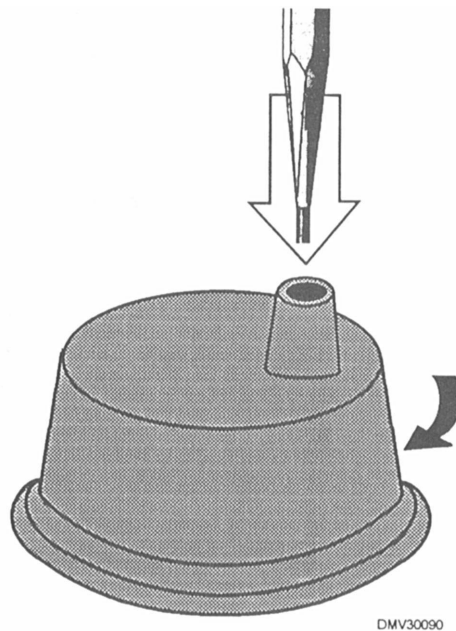


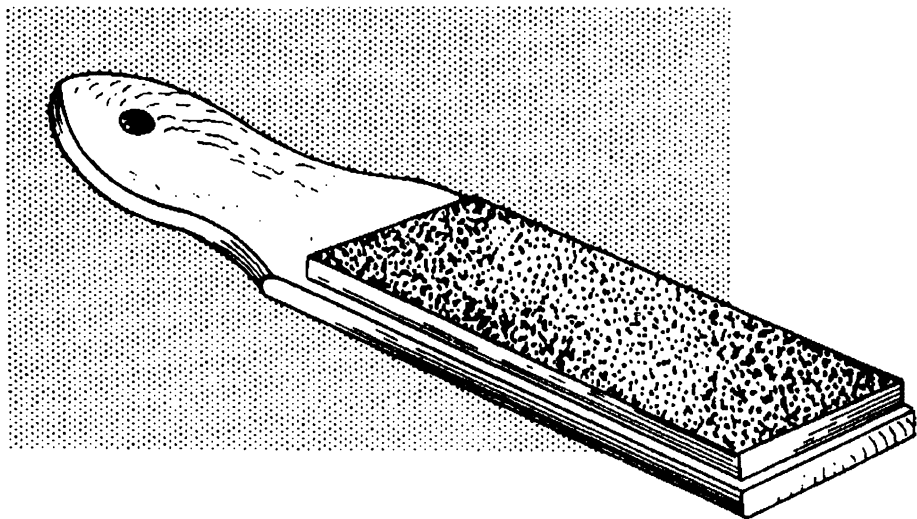
Figure 1-6.—The draftsman's pencil sharpener.

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Pencils, Continued

Sandpaper pad To sharpen a lead pencil to a elliptical, chiseled, beveled, or flat tip requires a sandpaper pad. A sandpaper pad is sheets of sandpaper lightly glued at the edges to a small wooden paddle. Expose approximately $\frac{3}{8}$ inch lead by shaving away the wood case around the lead or advancing lead from a mechanical pencil and rub the lead against the sandpaper to shape the point you desire. Keep your hands free of residue. Clean your hands and work space before working on illustrations.

Figure 1-7 shows a sandpaper pad.



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Figure 1-7.—Sandpaper pad with wooden handle.

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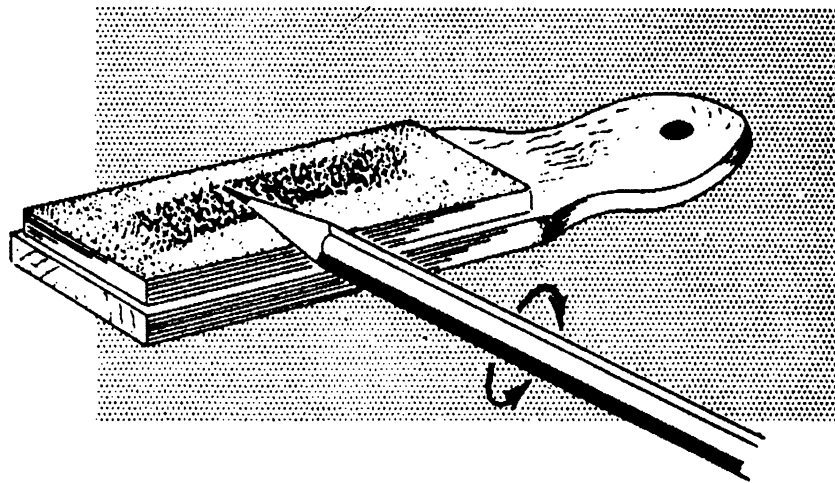
Pencils, Continued

Sandpaper pad (Continued)

To sharpen a lead to a conical point with a sandpaper pad, follow this table:

Step	Action
1	Expose 3/8 inch of lead.
2	Lay the lead against the sandpaper pad at a steep angle. (See figure 1-8)
3	Draw the lead back and forth across the sandpaper while simultaneously rotating the pencil between your fingers to create an evenly sharpened point.
4	Clean work space and wash hands before working on an illustration.

Figure 1-8 illustrates the angle of the lead to the sandpaper pad.



DMJA0092

Figure 1-8.—Using a sandpaper pad to sharpen lead to a conical point.

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Pencils, Continued

Sandpaper pad (Continued)

To sharpen a lead to a chiseled, beveled, or flat point with a sandpaper pad, follow this table:

Step	Action
1	Expose 3/8 inch of the lead.
2	Hold the lead against the sandpaper pad at an angle. (See figure 1-9.)
3	Draw the lead back and forth across the sandpaper.
4	Turn the pencil around 180 degrees.
5	Draw the lead across the sandpaper to approximately the same angle and depth as the other side. This will produce a chisel point.
6	Drawing the lead across the sandpaper favoring the left or right side or drawing the tip across the sandpaper at a 90-degree angle produces a left-beveled, right-beveled, or flat lead point.
7	Be sure to wash you hands and clean the surrounding area of graphite particles before drawing.

Figure 1-9 illustrates the angle necessary to produce a proper chiseled, beveled, or flat point.

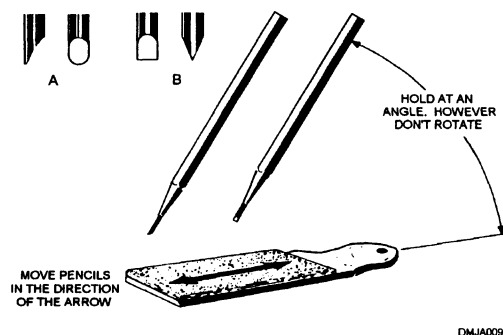


Figure 1-9.—Using a sandpaper pad to sharpen lead to either an elliptical point (A) or chisel point (B).

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Pencils, Continued

Line weight

The weight of lines drawn with pencils varies according to the pressure and direction of the stroke. You have probably already noticed that pencil lines widen as you approach the end of the stroke. Also, lines may increase or decrease in weight when you change direction of the stroke. Add interest, depth, and sensitivity to drawings by varying line weights.

Figure 1-10 shows various line widths possible with the pencil.

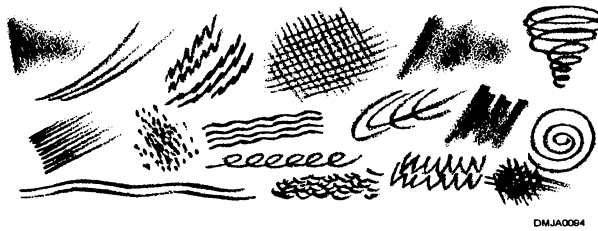


Figure 1-10.—Various line widths possible with the pencil.

Texture

You can create the illusion of texture with pencil strokes. Crosshatching can duplicate shades of grey. Broad strokes against illustration boards with a high tooth resembles concrete or stucco. You can infer texture without drawing every line in the pattern.

Figure 1-11 shows how you can imply a texture without drawing every line.

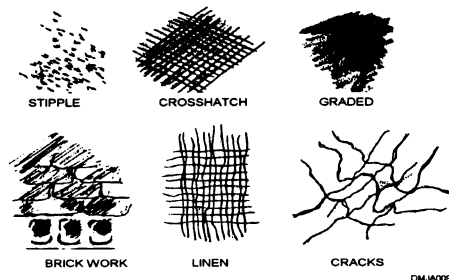


Figure 1-11.—Indicating texture.

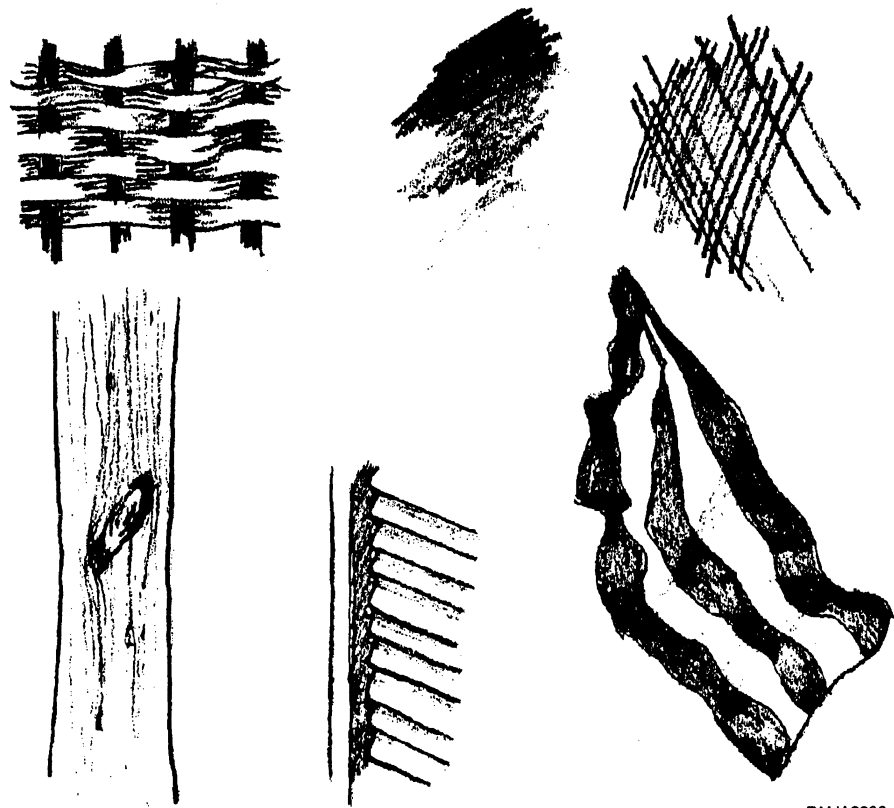
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Pencils, Continued

Tone

Pencil drawings may range from the white of the illustration board to the densest black of graphite. Pencil drawings may be continuous tone or line drawings. The paper you select for your pencil drawing determines degree of texture. The technique and media you select determine the density of tone.

Figure 1-12 shows texture and tone created by pencil strokes.



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Figure 1-12.—Texture and tone created by pencil.

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Pencils, Continued

The pencil illustration

Once you select the pencils, eraser, and paper, you are ready to begin illustrating. Start with a few thumbnail sketches to determine the angle of view, perspective, and mass tonal ranges. Using a medium grade pencil lightly over the paper surface, block in or sketch the main outlines in the drawing. Do not be too concerned with details at this point. Strive to correctly portray scale and perspective. Next, use a soft lead to place the light tones, then use an even softer lead to make the darker tones. Placing the light tones first will enable you to gage the tonal quality of the image to control the overall tonal key. Finish the drawing by adding details. At this point, use tortillions or stumps to blend strokes or the kneaded eraser to bring out the highlights. Switch to a harder pencil lead to draw fine or precise details. Keep erasures to a minimum. Keep the illustration clean.

Figure 1-13 shows the steps for developing a pencil illustration.

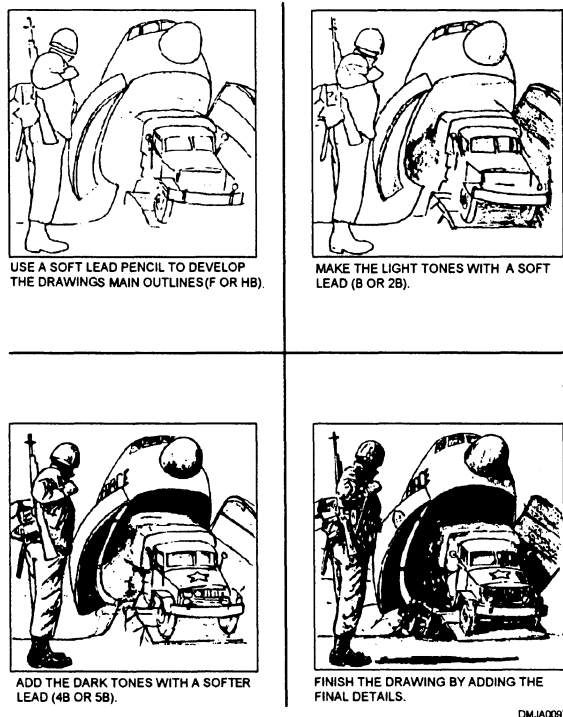


Figure 1-13.—Steps for developing a pencil illustration.

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Pencils, Continued

Color pencils	The primary difference between color pencils and graphite pencils is how easily color deceives when rendering tonal values. Color pencils handle the same as graphite pencils and create the same range of effects. Relatively new to fine arts rendering, the degree of permanence of color pencils is not certain. When creating illustrations in color, you have additional concerns about color compatibility, adjacency, and tonal reproduction. Refer to chapter 2, “Color Theory.”
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Carbon pencils	Carbon pencil lead is made of synthetic materials. These leads produce dense, dull, black lines that are not easily erased. They come in a variety of degrees of hardness. The softer leads are more versatile than the hard leads because the softer leads deposit their pigment more easily. Hard leads have a greater amount of binder, are more brittle, and are less dense in deposit.

Brushes

Introduction

A good paint brush is an asset, as is the knowledge of matching brushes to the media you intend to apply. Proper cleaning and storage of paint brushes will result in brushes maintaining a useful life for many years.

Paint brushes

Lettering, illustrations, and paintings are done with paint brushes that vary in composition but have similar physical characteristics. Brushes are composed of bristles or hair, a ferrule or quill, and a handle.

Figure 1-14 shows brush nomenclature.

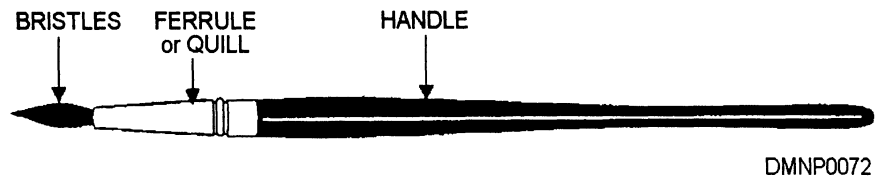


Figure 1-14.—Brush nomenclature.

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Brushes, Continued

Brush bristle nomenclature and testing

Paint brush bristles or hair have flattened, split ends called flags. The flags enable the bristles to trap pigment and move it around. The end of the bristles, enclosed by the ferrule, is referred to as the butt. Here brush deterioration generally begins with trapped pigment rotting the bristles. When judging bristle elasticity, you should bend the bristles at a 45-degree angle to a horizontal surface and observe where the bristles bend. The bend should occur approximately 1/3 the length from the ferrule. The bend of the bristle is called a heel. A brush that is too stiff to bend or bends too near the tip is an inferior brush.

Figure 1-15 shows bristle nomenclature.

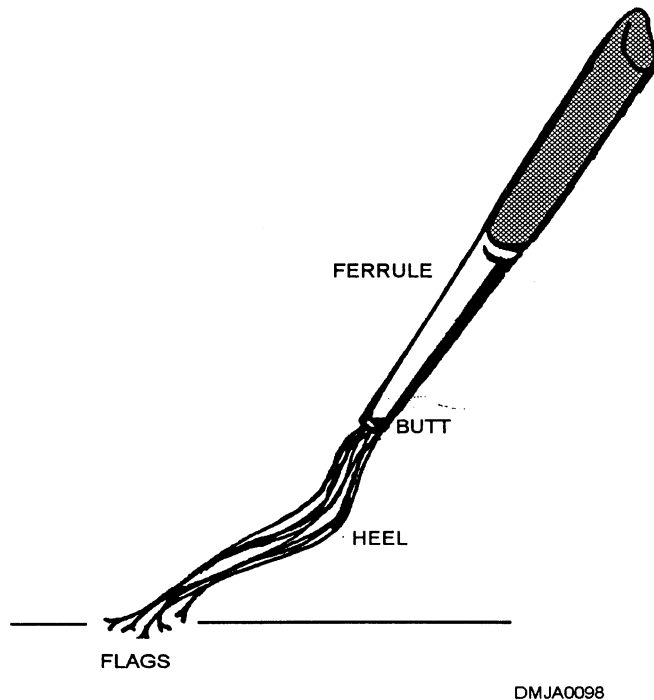


Figure 1-15.—Bristle nomenclature.

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Brushes, Continued

Brush bristles

Once collected and bound by hand, bristles were made from the hair of the tail of a kolinsky . Bristles are now made from hog, sable, squirrel, ox, goat, and camel hair, and synthetic materials such as nylon. Hog hair bristles are often used for oil painting. Sables are most responsive when used with water soluble pigments and ink washes. You can use sable brushes with oil and acrylic pigments; but, the heavier bodied pigments inhibit the natural spring in the brush. Squirrel, ox, and camel hair bristles and synthetic bristles are suited to a variety of pigments. These bristles have less spring and stand up well to paint and solvents. Oriental brushes used for calligraphic work and sumi-e are made of goat hair.

Bristle length

The length of brush bristles affects how easily you can apply paint with a brush. Short bristles tend to dig and shovel paint around the surface. Bristles that are too short or that have been trimmed from longer bristles are no longer good for painting. Long bristled brushes do not allow exact placement of pigment to a surface because of the flexibility of the bristles. Correct bristle length allows accurate placement and smooth covering of pigments.

Brush shape

The four common brush shapes are the fan, round, flat, and bright.

Figure 1-16 shows the common shapes of paint brushes.

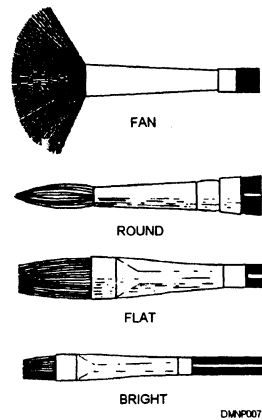


Figure 1-16.—Brush shapes.

Continued on next page

Brushes, Continued

Fan-shaped brushes	Fan-shaped brushes have their bristles spread out at the tip. Fan-shaped brushes are relatively new and work well with washes and large areas of pigment. Fan-shaped brushes also work well as blenders. Their bristles are often made from synthetic materials and are very durable. You can use fan-shaped brushes with any pigment.
Round-shaped brushes	Round-shaped brushes are normally made with sable or synthetic material. The round shape of the bristles hold more pigment than flatter brushes. The size of brushes varies; but, even the larger brushes are responsive to an experienced painter.
Flat brushes	Flat-shaped brushes are called flats. Flats have long bristles with a square-cut tip. It is difficult to apply paint with flat bristles because of the elasticity of the bristle. Flats are better suited for fluid strokes and blending. Flats will work well with any pigment.
Bright brushes	Brushes called brights also have a square-cut tip, but a shorter bristle length than a flat. The relatively short bristle of brights allows the painter to readily apply and maneuver pigment over a surface. Brights work well with any pigment.
Brush size	The size of a brush is written on the ferrule or handle of the brush. The bristle capacity of the ferrule determines brush size. Manufacturers use different size indicators, but they are generally numeric beginning with No. 00000 as the smallest.
Ferrule	The ferrule is the sleeve that binds the bristle to a brush handle. The sleeve may be made from metal, plastics, or natural quill. Some oriental brushes use copper wire. The ferrule is the most vulnerable point of the brush. Residual pigments and solvents tend to collect at the ferrule and accelerate deterioration. Bristles become brittle and break at the ferrule.

Continued on next page

Brushes, Continued

Handles

Handles made of wood or plastic hold the ferrule and the bristles. Oriental brush handles are made of bamboo or twigs. People give relatively little thought to brush handle length, but a handle that is too long or too short will imbalance the hand as it travels across a surface. Use short-handled brushes when you are working close to a surface and for detail work. Long-handled brushes can counterbalance the brush tip and are better suited for expansive areas without well-defined detail.

Cleaning brushes

After using a brush, clean it thoroughly. A brush properly cared for will last many years. Throw away brushes with crusted and curled bristles or reuse them as disposable paste brushes. Do not trim brush tips and continue to use them because the bristles will not respond correctly. In particular, keep the area around the ferrule clean. Shape and store the brush after cleaning.

To clean, shape, and store brushes, follow this table:

Step	Action
1	Remove as much color as possible by initially rinsing brushes: <ul style="list-style-type: none">● in water for water-based paints, and● in thinner or mineral spirits for oil-based paints.
2	Wet brush in lukewarm water after removing all color.
3	Lather palm of hand with mild face soap.
4	Stroke brush back and forth in hand.
5	Rinse thoroughly in clean water.
6	Shake excess water from bristles.
7	Shape bristles gently into original shape.
8	Store brushes with bristles up.

Continued on next page

Brushes, Continued

Shaping brushes

After cleaning, you should shape the bristles of the brush into their original shape. If you do not, the bristles will dry curled and the brush will no longer work well. With your fingers, gently shape the brush so that each bristle holds together and forms a tip. Place brushes in a drying or storing rack.

Storage

Store brushes in a clean condition and never allow a brush to dry or rest on its bristles. Place brushes bristles up in a glass or in a mug. Use a brush holder to store brushes when they are not in use or after cleaning. Do not allow pressure on brush bristles to curl the bristle. Store brushes in an enclosed area to minimize airborne contaminants and dust.

Figure 1-17 shows correctly stored brushes.

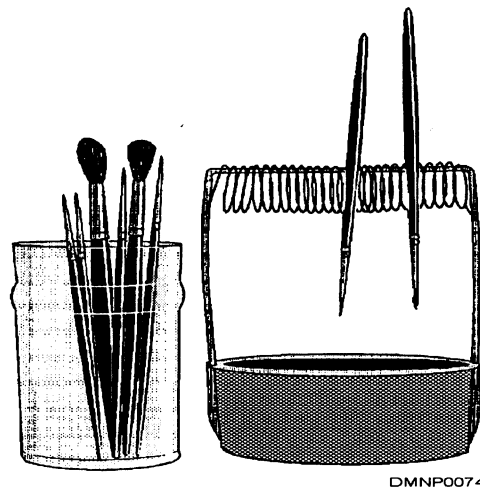


Figure 1-17.—Correctly stored brushes.

Storing oil brushes

If you use both water- and oil-based pigments, dedicate a set of brushes for oil-based pigment only. Once you use a set of brushes in oil pigment, they may retain residue oils that could ruin watercolor. Brushes used in watercolor, then used for oil-based pigment, may release water droplets that sit on the oil paint surface and retard drying. After cleaning oil-dedicated brushes and before storing them, add a drop of oil to the bristles. This keeps the bristles pliable and lessens the effects of harsh cleaning solvents.

Pen and Inks

Introduction

Pen nibs and reservoir pens are made by many different manufacturers and in a variety of styles. Proper care and correct use can prolong the useful life of pen nibs and reservoir pens. For extended study of pen and ink drawing, review the works of M. C. Escher and Edvard Munch.

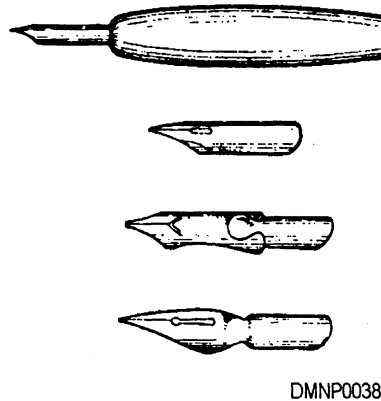
Pen nibs

Pen nibs detach from handles or drawing instruments. There are drawing nibs and lettering nibs. After you select an appropriate pen nib, make sure the nib is clean. If a nib has not been used before, moisten it slightly to remove the manufacturer's protective oils. Do not fill a pen nib more than 3/8 inch up the nib blade. This prevents the nib from bleeding on the paper surface.

Drawing nibs

In general, nibs used for drawing have more spring than lettering nibs. Like a pencil, varying the width of the stroke creates a line that is more sensitive and interesting. Some nibs are so stiff that excessive pressure gouges the paper surface by disturbing the fibers. Torn fibers absorb the ink giving lines a fuzzy appearance. Other nibs have more spring that allows you to vary line width. Quill-nibbed pens produce an extremely fine line and are very responsive.

Figure 1-18 shows quill pen nibs.



DMNP0038
Figure 1-18.—Quill pen nibs.

Continued on next page

Pens and Inks, Continued

Lettering nibs

Lettering nibs are pen points used primarily for lettering or calligraphy. Some lettering nibs have hinged blades serving as ink reservoirs. Lettering nibs are available for right- and left-handed artists. The difference is the angle of the nib where it contacts the paper surface. Lettering nibs have five basic shapes: the square, the round, the oblong, the oval, and the split nib. The split-nibbed lettering pen is often called a spencerian nib after the spencerian alphabet that it is particularly suited for creating.

Figure 1-19 shows five common lettering nib shapes.

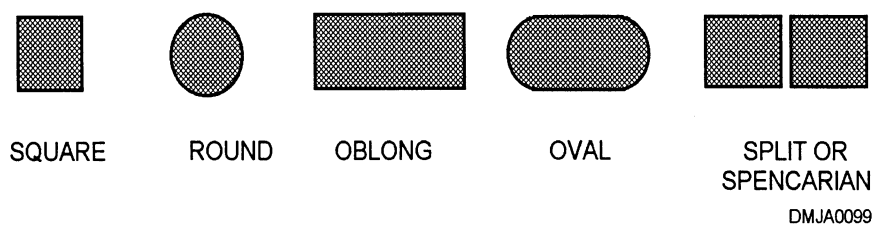


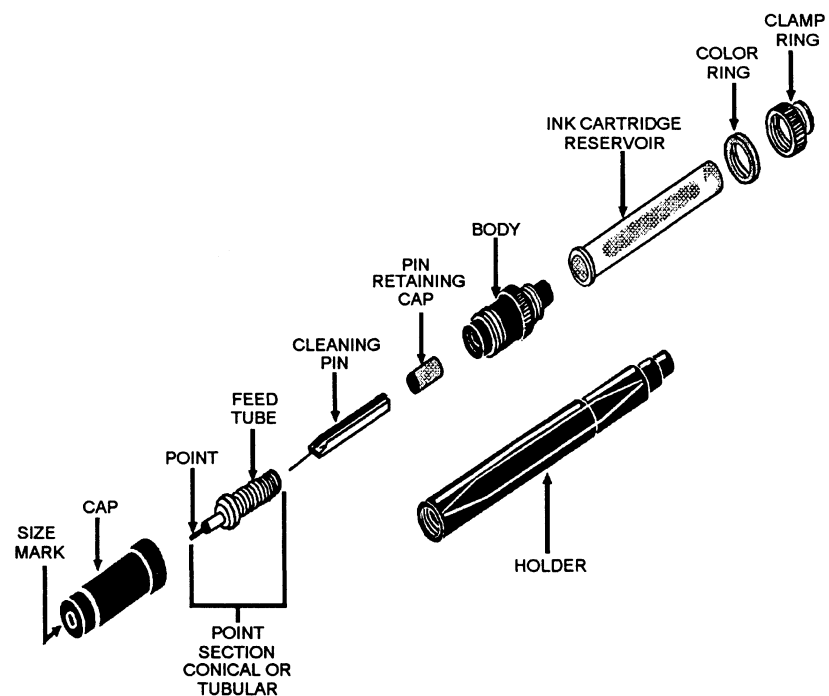
Figure 1-19.—Common lettering nib shapes.

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Pens and Inks, Continued

Reservoir pens Reservoir pens, sometimes referred to as technical pens, have a pen nib, a feed system, and an ink reservoir. Reservoir pens have conical or tubular tips. Tubular-tipped reservoir pens attach to the scribe of hand lettering devices. Reservoir pen nibs create lines of uniform width. The feed system is a weighted, gravity-fed needle that regulates ink flow. The reservoir is a refillable plastic cartridge attached to the feed system and housed inside a handle. The pen is ready to use when you hear a light clicking sound made by the weighted needle as you gently shake a pen up and down.

Figure 1-20 shows an exploded view of a reservoir pen.



DMNP0039

Figure 1-20.—An exploded view of a reservoir pen.

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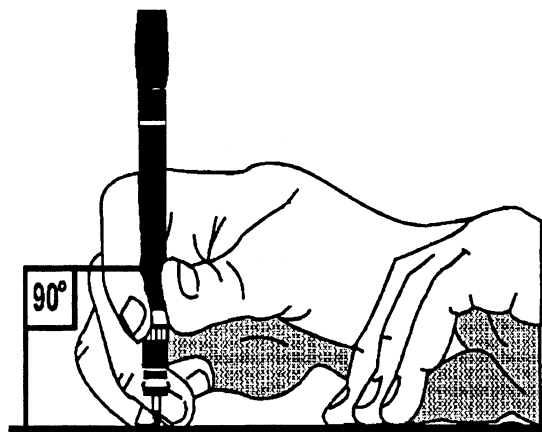
Pens and Inks, Continued

Reservoir pens (Continued)

To use a reservoir pen, follow this table:

Step	Action
1	Remove the holder, clamp ring, and ink cartridge reservoir.
2	Fill the reservoir two-thirds full of drawing ink.
3	Holding a tissue over the pen nib, replace the reservoir, clamp ring, and holder.
4	Gently shake the pen up and down away from the drawing surface allowing the weighted needle to feed ink into the feed tube.
5	Moisten a tissue and touch the pen nib to it until ink appears.
6	Hold the pen between thumb and forefinger perpendicular to the drawing surface.
7	Keep tissue near to remove excess ink and paper fibers from the nib as necessary.

Figure 1-21 illustrates a correctly held reservoir pen.



DMNP0040

Figure 1-21.—Holding a reservoir pen correctly.

Continued on next page

Pens and Inks, Continued

Improper pen handling

Holding pen nibs or reservoir pens to the paper surface incorrectly may result in undesirable lines that have defective resolution.

Figure 1-22 illustrates the consequences of improper use of the pen and insufficient ink.

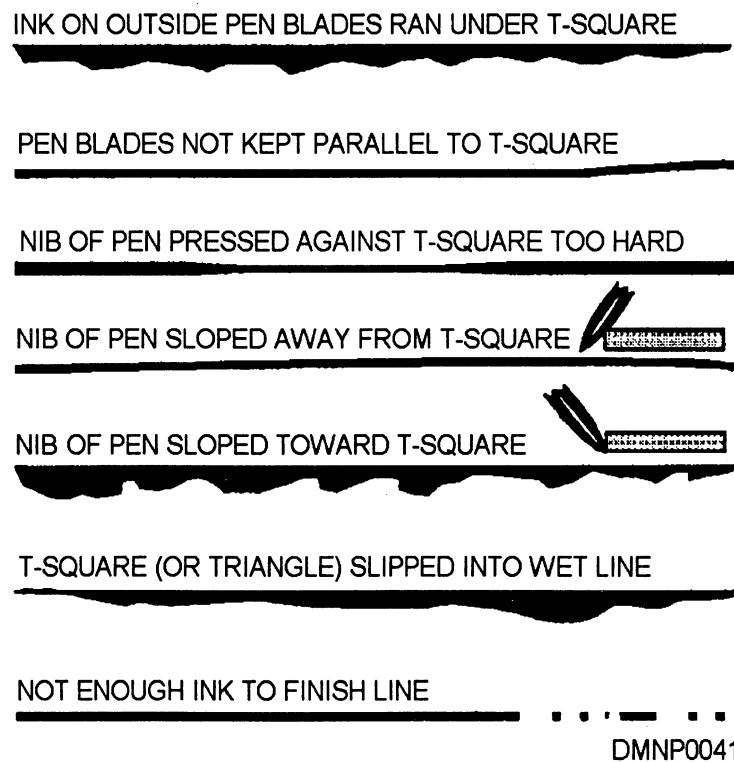


Figure 1-22.—The consequences of improper pen handling and running out of ink.

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Pens and Inks, Continued

Pen care

Pen nibs and reservoir pens must be kept clean. Crusted ink will ruin a drawing in progress and permanently freeze a technical pen. Pen nibs should be cleaned in warm water with mild detergent. Use water and ammonia to remove stubborn ink. Do not leave reservoir pen parts in an ultrasonic cleanser for more than 10 minutes. Heat from the vibrating cycles will melt the plastic parts of the pen. Before you clean a reservoir pen, consider the following guidelines:

- thoroughly clean pens before periods of nonuse, an idle pen floods with ink that coagulates, preventing the needle weight from moving freely to distribute ink into the nib,
- disassemble the pen only for thorough cleaning to prevent damage to the fine wire needle in the nib, and
- handle all parts carefully.

To clean a reservoir pen, follow this table:

Step	Action
1	Remove the holder, clamp ring, and reservoir.
2	Empty cartridge, rinse, and set aside to dry.
3	Remove the cap, rinse, and set aside to dry.
4	Loosen point section before soaking: do not force pen section loose, instead allow to soak and renew attempt to loosen.
5	Soak pen in water and ammonia or mild detergent.
6	Rinse well.
7	Thoroughly dry pen parts before reassembly.

Continued on next page

Pens and Inks, Continued

Ink

Ink is a water-soluble emulsion of opaque pigment. Ink comes in colors, but the most opaque and the color you will be most familiar with is black. Although you can thin ink with water, once ink dries it becomes waterproof. Old ink is no longer useful. The emulsion separates or the pigment thickens. If the ink has separated, throw it away. If the ink has thickened, you may be able to salvage it by adding a small quantity of water. Thinning ink with water reduces opacity.

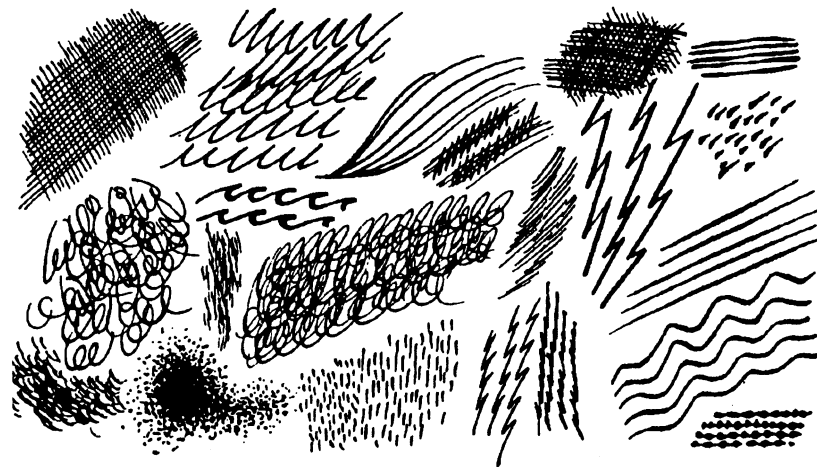
Ink drawing

Drawings made in ink are referred to as line drawings. The image is black and white. Areas that appear grey do so only by textural variation.

Textural variations

Stipple and crosshatch are examples of textural variations. How light or dark areas appear depends on the ratio of black ink lines to the white paper space between the lines. When rendering textural effects, make sure the first set of lines dry before crossing them with another. If you do not, the lines pool and blur or the paper becomes saturated and the pen nib tears the paper fiber.

Figure 1-23 shows lines made by a variety of pens and brushes.



DMJA0100

Figure 1-23.—Varied effects with different pen points and brushes.

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Pens and Inks, Continued

Drawing over pencil lines in ink

You may draw in ink over lines previously drawn in pencil. The pencil sketch may be drawn directly on the paper surface or on tracing paper and transferred to the paper surface. After the inked in portion of the drawing is complete, remove the graphite underdrawing with a soft eraser. If the basic pencil drawing contains too much graphite, the ink will crawl, or roll away from the pencil line. Should this occur, carefully remove some of the graphite with a soft eraser.

Ink washes

Drawings made in diluted ink with a brush are called washes. Washes are continuous-tone renderings. Washes are difficult to control because of the amount of water in the medium and have very little latitude for correction. Ink washes require preparation and planning.

Preparing for ink washes

Before putting the brush to paper, you must do a basic drawing, prepare the paper surface, and mix the value range of your washes.

Preparing a paper surface

Washes are painted on watercolor paper. The weight of the paper determines whether or not you need to fix the paper to a solid surface before painting. This procedure is called stretching the paper. Thin paper that is not stretched will curl and buckle during the painting process. Thick paper, rated at 300 lbs or more, does not require stretching.

Stretching the Paper

To prepare watercolor paper, follow this table:

Step	Action
1	Select a paper and allow it to soak fully submerged in lukewarm water for approximately 20 minutes.
2	Remove the paper from the water and place it on a solid board.
3	Using craft-paper tape, tape all around the edges of the paper.
4	The paper is ready for use when the sheen of the water disappears from the paper surface. You can also wait until the paper is completely dry.

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Pens and Inks, Continued

Basic pencil drawing

Develop a drawing by sketching the outlines of the image with a pencil in the H to 2B range. Determine tonal areas and highlights. Mask or protect areas that you do not want to paint. You may use masking tape, rubber cement, or a commercially prepared liquid frisket.

Preparing the pigment

The pigment you use may be lampblack, inks, or watercolor. The procedure is the same. Mix values using a large amount of water and a little pigment for lighter tones and little water and more pigment for dark tones. Prepare a sufficient amount of wash to complete an entire drawing. It is difficult to remix an exact duplicate of a specific value that you have used. Save the wash in small jars or a palette with a lid. A palette is a tray for holding and mixing paint.

Assemble tools

Assemble any additional tools you require before you begin painting. Once begun, you should not leave the wash until you finish it. Additional tools include containers of clean water, sponges, extra jars, clean rags, special effects materials, and brushes.

Special effects materials

Special effect materials are items that create an effect with water and pigment. For example, salt repels pigment leaving small white dots. Sponges absorb pigment and water leaving a mottled effect on the paper. You may also spray an enamel or lacquer into wet images for an interesting reaction. Experiment with different items to find out what effect appeals to you.

Brushes

Assemble the sable brushes you are most comfortable using. A No. 3 and No. 5 are common wash brushes. Have a few larger sizes for those large areas of paper. Keep the brushes clean by flushing them often with clean water.

Continued on next page

Pens and Inks, Continued

Working in wash

You have assembled all materials, drawn an image, and are ready to begin working in wash. Position the board and the paper surface at approximately a 25 to 30-degree angle to each other to encourage the wash to flow toward the bottom of the paper. Keep the area you are working in moist to lessen the visibility of each brush stroke.

To work a flat wash, follow this table:

Step	Action
1	With all material assembled, moisten the surface of the watercolor paper (if the paper is dry) or begin the wash when the sheen of the water leaves the paper surface (just after stretching).
2	Moisten the immediate area around the area you intend to work.
3	Select a brush that will allow you to make one complete stroke in the area you are painting without reloading.
4	Load the brush with wash. Stroke the brush against the edge of the wash container so you may move your brush to the paper without dripping wash.
5	Apply the wash from the upper-left corner working from left to right across the paper.
6	Reload the brush and work from right to left overlapping the puddle at the bottom edge of the previous stroke.
7	Continue until the wash is complete.
8	Squeeze excess wash from your brush and soak up the puddle at the bottom of the last stroke.
9	Set aside to dry.
10	Continue with the remaining image or remove all masks and friskets.

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Pens and Inks, Continued

Working a wash (Continued)

Figure 1-24 illustrates the steps in working a flat wash.

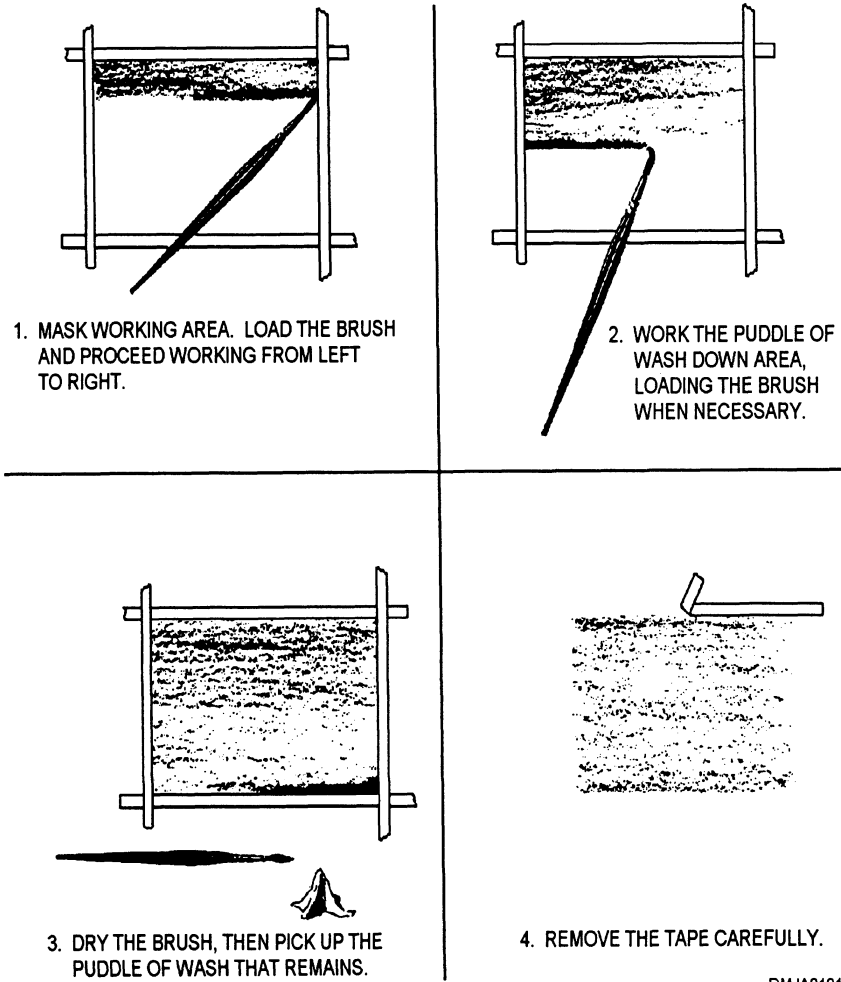


Figure 1-24.—Steps in working a flat wash.

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Pens and Inks, Continued

Graded washes Graded washes are washes in which the pigment goes from light to dark or dark to light. Prepare your board as you did for the flat wash. For light areas use a wash that has little pigment and proceed to stronger washes. Start at the top of the page with either the lightest wash or the darkest wash.

Figure 1-25 illustrates procedures for painting a graded wash.

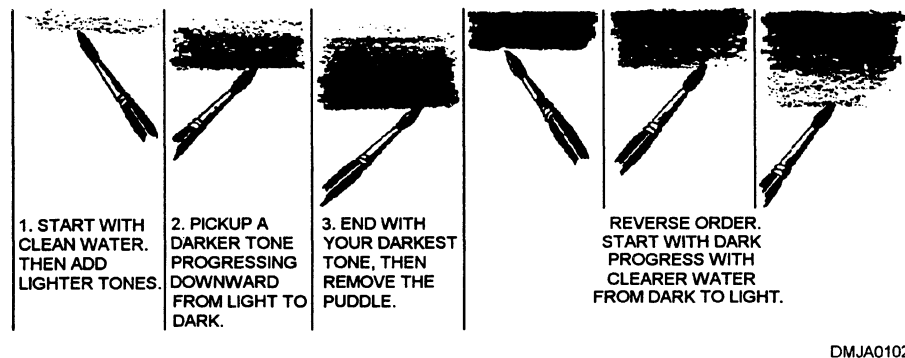


Figure 1-25.—Steps for painting a graded wash.

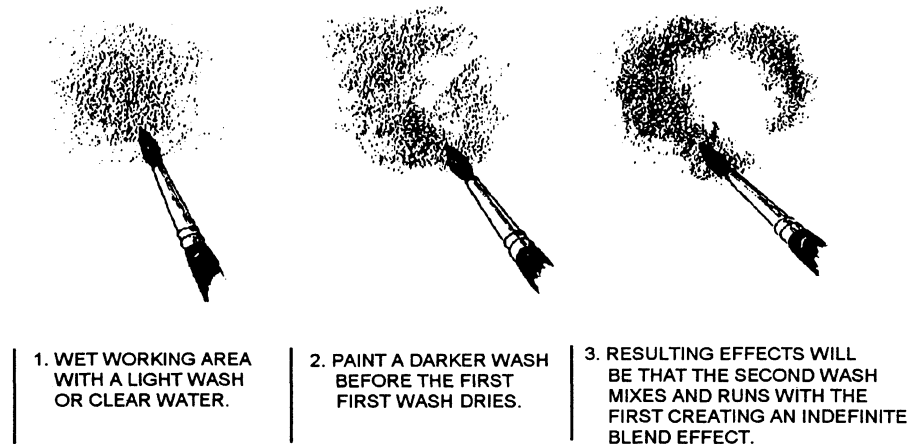
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Pens and Inks, Continued

Indefinite blends

An indefinite blend is a portion of a painting where the applied pigment settles on the paper surface without manipulation. The effects are random within the designated area of the indefinite blend. Select an area to create an indefinite blend, clouds in a sky, for example. Moisten only the area the indefinite blend is to occupy. Add one or two darker tones. Select tones that are darker than the tone you want in the finished picture as washes dry lighter than they appear wet. Excess water will randomly carry the pigment across the paper surface. When the moisture evaporates, the pigment will settle leaving a soft-edged image of what you should perceive as clouds.

Figure 1-26 illustrates the procedure for creating an indefinite blend.



DMJA0103

Figure 1-26.—Creating the indefinite blend.

Pastels and Charcoals

Introduction

Charcoal and pastels are similar in traditional application and in their painterly effects. Select paper surface texture carefully because this texture will dictate the overall appearance of charcoal or pastel drawings. For an extended study of charcoal and conté crayon drawings, review the work of Michelangelo, Rubens, and Rodin. To review sensitive renderings in pastel, study Mary Cassatt and Edgar Degas.

Charcoal

Charcoal is carbonized willow twigs. Sometimes called vine charcoal, it produces a dense black, dull image and leaves a powdery residue. Charcoal sticks may be encased in a sleeve of wood like a pencil.

Degrees of hardness

Charcoal is available in different degrees of hardness. Extended carbonization increases the hardness of charcoal. As charcoal becomes harder, it is less useful as a drawing medium.

Drawing with charcoal

Charcoal is a drawing medium. Charcoal is an excellent medium to use when practicing drawing exercises. Select charcoal in a degree of hardness according to your preference. Handle the charcoal stick as you would a pencil. Pay particular attention to removing the dust that builds up with each stroke. Blend large areas with stumps or tortillons and create highlights with soft, hard, and kneaded erasers. The images produced by charcoal are dense.

Figure 1-27 shows vine charcoal.



Figure 1-27.—Vine charcoal.

Charcoal finishing

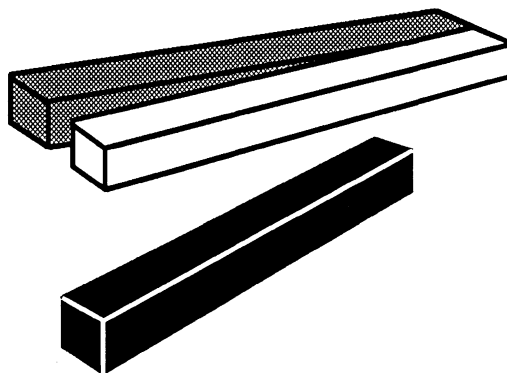
Charcoal drawings require fixative when complete.

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Pastels and Charcoals, Continued

Conté crayon	Conté crayons are pigment compressed with a binder into stick form. Conté crayons come in white, black, sanguine, bistre, and shades of grey. Sanguine was a favored medium of the old masters. Bistre is often used with washes.
Degrees of hardness	Conté crayons are available in different degrees of hardness. The crayon produces thin, dense, dull lines. Use them on their side for broad swatches of pigment. They are small in diameter and length.
Drawing with conté crayon	Conté crayon is a drawing medium. Select a crayon according to your preference. Handle the crayon as you would a pencil. Dust is less likely to build unless your strokes are extremely heavy. Blend large areas with stumps or tortillons and create highlights with soft, hard, and kneaded erasers. Although often used for preliminary sketches, conté crayon drawings also create fine finished drawings.

Figure 1-28 shows conté crayons.



DMJA0105

Figure 1-28.—Conté crayons.

Conté crayon finishing	You should spray conté crayon drawings with a fixative when complete.
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Pastels and Charcoals, Continued

Pastels	Pastels are pigment, chalk, and a binder in stick or pencil (wood encased) form. The binder is usually gum tragacanth. Pastel sticks apply broad swatches of color while pastel pencils draw thin, precise lines. You may use pastels as a opaque or semi-opaque medium. Pastels combine easily with other media such as pencil, crayon, and paints to form mixed media images.
Degree of softness	Pastels come in soft, hard, or semi-soft sticks and in pencils. The softer the pastel, the more dust produced by heavy strokes. Hard pastels work better on smooth-surfaced paper than softer pastels that require a paper with some tooth.
Drawing with pastels	Pastels are a drawing medium capable of producing painterly images. When drawing with pastels, you should have stumps or tortillons, a stiff brush, and soft, hard, and kneaded erasers nearby. The paper you select must have tooth. Hold pastels as you would pencils. Drawings generally proceed from dark to light. Shading and color gradations are made by crosshatching or overstroking pastel strokes until you produce the desired effect. When drawing with oil pastels, use a brush lightly moistened with turpentine for blending.
Pastel finishing	At the completion of the drawing, spray over the entire image with fixative. If the drawing loses all highlights, the fixative was too strong and you will have to redraw the highlights.
Storing pastels	When storing pastels, separate the drawings with a sheet of acetate. Avoid surface pressure and lateral movement. Although sprayed with a fixative, the surface of a pastel drawing may still rub off and smear.
Oil chalk	Oil chalk has the appearance of pastels but, it contains oil. Do not use oil chalk with pastels. The oil binder may leech into the pastel paper leaving a halo of darker paper around the pigment. Use oil chalk with oil-based pigments and impasto. You can also use oil chalk to detail or delineate. Turpentine brushed onto oil chalk will eliminate or blend strokes.

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Pastels and Charcoals, Continued

Exercises in charcoal and pastel

Pastels and charcoals are drawing mediums with painterly handling characteristics. Practice using charcoal in line drawings. Vary your strokes; overlap and crosshatch for value. Then practice continuous-tone drawings by blending values with a stump and picking out highlights with a kneaded eraser. Practice the above techniques with pastels. Pastels offer the additional challenges of color. Blending colors and values in pastels requires strokes over other strokes. Practice blending pastels.

Figure 1-29 shows charcoal lines possible in vine charcoal.

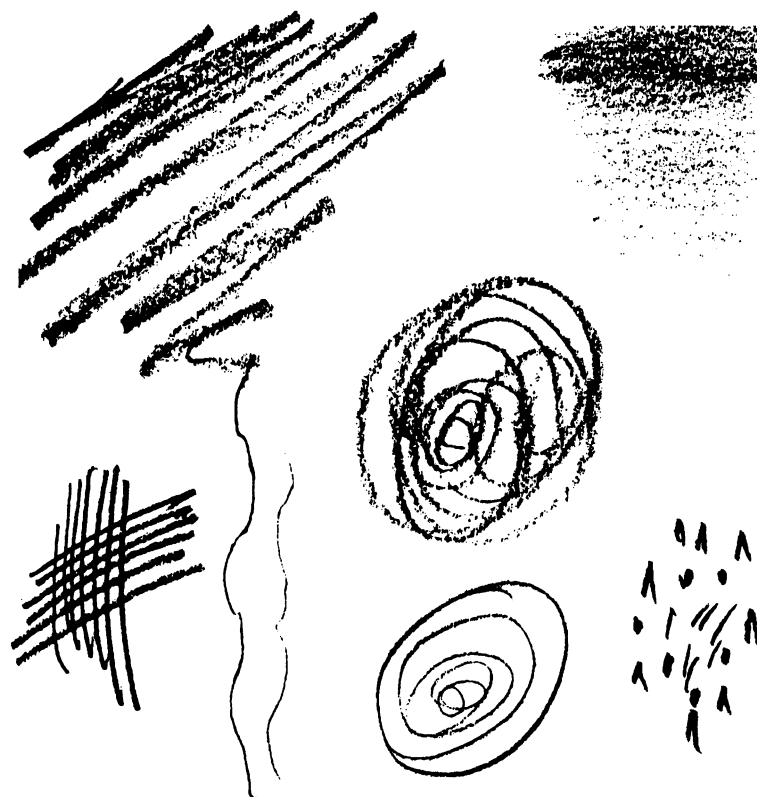


Figure 1-29.—Line variations possible with vine charcoal.

Oil-Based Pigments

Introduction	Painting with oil-based paints has long been regarded as the provenance of traditional or classical fine arts. Oil paint, once difficult to use, required extensive knowledge of chemicals and minerals. Now oil paint is ready to use from the tube and, with specific additives, is easy to apply. For extended study on classic oil painters, review the work of John Singer Sargent and Rosa Bonheur.
Oil-based pigments	Oil-based pigments are pigments ground in an oil base. Oil-based pigments are available in tubes, cans, and pressurized cans. Oil-based pigments in tube form are generally what we know as oil paint. This section on oil-based pigment will also briefly cover lacquer and enamel paints.
Oil paint	Oil paints are pigments ground in linseed oil. The most pure color is attainable straight from the tube. Impressionist painters, obsessed with purity and light, often used paint from the tube without additives. Today, oil painters use additives to extend the pigment, change consistency, and increase or reduce drying time. Oil paint requires a finishing treatment when the painting is complete.
Oil paint extenders	An extender slightly increases the mass of pigment without changing its hue. An extender thins the viscosity of the paint giving it the consistency of melted butter. Use an extender in oil paint when you want to create a glaze or to apply transparent color over the surface of the painting. This technique is referred to as stumbling.
Oil paint impasto	An impasto is a paste or putty additive to oil to create a heavier bodied pigment. An impasto increases the mass and viscosity of pigments without changing its hue. Use an impasto when you want to thickly build up pigment on the painting surface and for textural effects.
Oil paint Reducers	Reducers are chemical additives that reduce the drying time of oil paint. Reducers do not affect hue, but they will thin pigment consistency. The more reducer added to paint, the less time it takes to dry.

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Oil-Based Pigments, Continued

Oil paint opacity and permanence

Oil paints are an opaque medium. You can achieve near transparency or translucence by adding an extender and using the stumbling or glazing techniques. Artist grade oil paint is permanent. Pigments made by organic or mineral derivatives are more permanent than synthetic manufactured color which tends to fade. Without an appropriate ground and substrate, oil paints will crack and flake off the surface of the painting.

Oil paint grounds

The ground and preparation of the substrate is important. An incorrectly prepared surface effects pigment adhesion and permanence. The most common grounds are artist's flake white, artist's white lead in oil, or gesso. Household or industrial white paint is not suitable as a ground because this paint loses its elasticity over time and increases the likelihood of cracking and flaking. You should not apply a ground too thickly. It is better to apply two thin coats. The ground should not ooze out the back of the canvas through the linen mesh.

Substrates

Substrates or the surface on which you apply oil paint are canvas, canvas board, masonite, wood panels, and metal. Before applying a ground to the substrate, seal the substrate with a mixture of rabbitskin glue.

CANVAS: Canvas, bought in rolls, must be attached to stretchers before painting. Once you have secured canvas to a stretcher (a wood frame), make sure to cover the canvas with a mixture of rabbitskin glue and gesso. Be sure to apply the ground to the edges of the canvas where it wraps around the stretcher. This is the first area to deteriorate and it receives the most abuse. Some artists prefer the spring of the canvas under their brush as they paint.

CANVAS BOARD: Canvas board is linen or canvas already adhered to a solid surface such as rigid cardstock or thin wood panels. Many artists prefer canvas board because they do not have to stretch the canvas themselves, and canvas board provides a solid surface on which to paint. The solid backing also offers protection from mishandling and puncture.

Continued on next page

Oil-Based Pigments, Continued

Substrates (Continued)

MASONITE: Masonite is a wood fiber pressed board commonly available in hardware stores. Use untempered masonite. Tempered masonite contains oil providing an unsuitable foundation on which oil-based paints cannot adhere. There are two sides to a masonite board. One side of masonite is smooth and the other side of masonite has a wire mesh texture. Select the side of masonite textured to suit your needs. Large masonite panels may need stretchers to prevent warping and buckling. Size masonite with rabbitskin glue before applying a gesso ground.

WOOD PANELS: Wood panels are surfaces to paint on made from wood. Size and ground wood panel boards as you would masonite.

METAL: Sometimes you may have to paint on metal surfaces. Lightly abrade the surface with a fine grade steel wool before priming. Oil-based pigments painted over metal will take longer to dry than over canvas or wood.

Lacquer-based pigment

Lacquer-based paints are paints suspended in lacquer solvent. They are common paints available as household or shipboard cans and pressurized cans of paint. If the only paint available is lacquer-based paint, be sure to clean your brushes immediately after use with lacquer thinner or mineral spirits. Remove the solvent residue by washing brushes in mild soap and water.

Enamel-based pigment

Enamel-based paints are also common household or shipboard paints. Enamel paints are available in cans and pressurized cans. If enamel-based paints are the only paint available to you, be sure to thoroughly clean the brushes in mineral spirits before washing them in mild soap and water.

Lacquer-and enamel-based pigments

If you must use lacquer- and enamel-based pigments on the same project, do not apply lacquer-based paint over an enamel paint. The lacquer-based paint curdles enamel-based paint and may immediately peel it from the substrate.

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Oil-Based Pigments, Continued

Painting with oil paints

The four ways of painting in oil paints are referred to as underpainting, overpainting, alla prima painting, and improvised painting.

Underpainting

Underpainting is the technique of painting multiple thin coats of paint before painting (overpainting) the final layer of paint. Oil paints used for underpainting should contain less oil than paint used for top layers. Underpainting may be classified as toned ground, grisaille, underpainting in light color, underpainting in dark color, and underpainting in contrasting colors.

TONED GROUND: Underpainting a toned ground in a middle-toned value is simply painting a colored canvas.

GRISAILLE: Underpainting in grey or a mottled grey is called grisaille and is most often used as a background in portraiture.

UNDERPAINTING IN LIGHT COLOR: Use light color as a base coat and accent with a purer or dark color to produce luminous effects.

UNDERPAINTING IN DARK COLOR: Use dark color as a foundation when you intend to apply a lighter color for effect.

UNDERPAINTING IN CONTRASTING COLOR: To underpaint in contrasting colors is to first paint a layer of chosen pigment and apply a contrasting color over it. This technique enhances the impact of colors, but is difficult to control.

Overpainting

Overpainting is the technique of painting the final layers of paint. Stumbling and glazing are overpainting techniques.

SCUMBLING: Stumbling is a form of overpainting that requires a light oil paint reduced to a translucent pigment. The translucent pigment is then painted over an already dark painted layer of underpainting. The more contrast in tonal value between the two layers, the more dramatic the effect.

GLAZING: Glazing is the opposite of scumbling, although it also requires reducing oil paint to a transparent pigment. You apply a dark pigment over a layer of light underpainting to leave a transparent film.

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Oil-Based Pigments, Continued

Alla prima	Alla prima painting is a technique in which the painting is started and finished in one sitting. Only the finishing step is applied later after the painting dries.
Improvised painting	A technique in which there is no structure or preplanning of images and paint application is called improvised painting.
Special equipment	<p>Special equipment used to create special effects consists of scraping tools, paper towels or sponges, and toothbrushes. Tools you chose to create special effects is limited only by your imagination.</p> <p>SCRAPING TOOLS: Scraping tools remove pigment from canvas. A scraping tool leaves a distinct mark and can expose the linen texture of the canvas. Scraping tools include palette knives, razor blades, pins, nails, saw blades-any object that will remove the pigment.</p> <p>PAPER TOWELS and SPONGES: Paper towels and sponges push pigment around on the canvas surface imparting their own imprint to the paint.</p> <p>TOOTHBRUSHES: Toothbrushes or any stiff bristled brush will texture paint when you stab or drag the bristles through the pigment.</p>
Oil paint storage	When painting in oil paint, you can save excess paint left on the palette between painting sessions by immersing the palette in clean, cool water. Water does not dilute or affect oil-based paints.
Finishing techniques	Most oil paints require an over coat of thin, soft varnish or shellac. You may apply varnish or shellac as a matte or gloss surface treatment. Make sure the painting is thoroughly dry before applying a finish coat. If you do not, moisture trapped under the finish medium hazes or forms white clouds. This aberration is known as bloom.
Exercises in oil paint	Practice handling oil-based paints with a brush. Load the brush with the pigment. Palette the brush to position the pigment. Blend colors and values. Develop a thorough, methodical procedure for painting.

Acrylic-Based Pigments

Introduction

Some artists consider acrylic-based pigment a water-based medium because when wet, the pigment is water soluble. But, acrylic-based pigments are not a pure water medium. Acrylic-based pigments have synthetic properties that alter their consistency, permanency, and application. For extended study of acrylic-based painting, study contemporary works from artists such as Georgia O'Keefe and Helen Frankenthaler.

Acrylic-based pigments

Acrylic-based pigments are pigments mixed with a synthetic binder of acrylic resin emulsified in water or turpentine. Acrylic resin is a plasticizer that gives acrylic paints elasticity and endurance. Acrylic-based pigments have gained tremendous popularity since their introduction in the 1960s because of their ease in handling, clean up, color intensity and choice. You will most often encounter acrylic paint with a water base.

Acrylic paint

Acrylic paints are pigment and powdered acrylic resin emulsified in water. Acrylic paint is water soluble when wet and waterproof when dry. Acrylics dry quickly. Acrylic color is brilliant with strong covering power; however, it sometimes stains. You can use additives to extend the pigment, change consistency, and increase drying time.

Acrylic paint extenders

An extender for acrylic paint is called an acrylic gel medium or acrylic polymer emulsion. The extender has a milky white appearance that disappears when dry leaving a gloss or matt finish to the pigment. Combining gloss and matt extenders yields a semigloss finish. You can add water to acrylic paint even after adding an extender. Expect the drying time for the paint to increase.

Acrylic paint impasto

An impasto is a thick mass of acrylic modeling paste, marble dust, and filler. By mixing impasto with acrylic paint, you can add surface texture to your painting. Impasto has the consistency of paste or dough and dries slowly. The outside skin dries faster than the inside creating large cracks that may require filling. When painting with impasto, use a substrate with a rigid backing.

Continued on next page

Acrylic-Based Pigments, Continued

Acrylic paint permanence and opacity

Artist grade acrylic paint is permanent. You can thin acrylic paint with water but, overthinning causes the pigment to separate lessening its permanence. Once it is dry, you can clean the surface of an acrylic painting with mild soap and water. Wiping the surface of an acrylic painting with cleaners containing petroleum or coal tar derivatives may soften or dissolve the paint.

Acrylic paint grounds

You do not require ground or surface preparation when painting in acrylic paint because of the outstanding adhesive quality of the binder. There is an acrylic gesso available for painters who prefer to paint over a ground. This gesso is very smooth and may be used under oil paintings to provide a foundation with some elasticity. You will not be able to paint with acrylic paint over an oil-based or oily foundation.

Substrates

Substrates or the surface on which you apply acrylic paints may be canvas, canvas board, masonite, wood panels, and metal. You may also apply acrylic paints to paper products and fiber cloth. No sizing or ground is required. When using an impasto, paint on a rigid backed, nonabsorbent substrate.

Painting in acrylic paints

Acrylic paints have the consistency of oil paint and the application characteristics of watercolor. Acrylics dry fast so you can build up successive washes quickly. You may apply transparent or semitransparent glazes over solid values. Use a wet or dry brush blending technique to blend acrylics.

Continued on next page

Acrylic-Based Pigments, Continued

Special equipment

Special equipment to create special effects may consist of scraping tools, paper towels or sponges, and toothbrushes or mouth atomizers.

SCRAPING TOOLS: Scraping tools remove pigment. Scraping tools leave distinct marks and can expose the linen texture of canvas or the weave of paper. Scraping tools include palette knives, razor blades, pins, nails, and saw blades. You can use any object to scrap away paint from a substrate providing you do not damage the surface of the substrate.

PAPER TOWELS and SPONGES: Paper towels and sponges push pigment around and leave an imprint in the remaining pigment.

TOOTHBRUSHES and ATOMIZERS: Toothbrushes or stiff bristled brushes and atomizers leave a splattered or mottled effect on the painting surface.

Acrylic paint storage

Prepare sufficient acrylic paint for one painting session. Acrylic paints dry too quickly to leave for any period of time.

Acrylic finishing

An acrylic painting does not require a finish coat of varnish or shellac but, a finish coat will provide some measure of protection and even out irregular surface reflections. If you want to apply a finish coat to an acrylic painting, use an acrylic medium in gloss, semigloss, or matt. Do not use a petroleum-based acrylic varnish because petroleum derivatives may discolor and soften acrylic paint.

Exercises in acrylic paints

Painters in acrylic should frequently exercise painting techniques. Acrylic paint is not only one of the most versatile mediums but also one of the trickiest. Try underpainting and overpainting in acrylics. Paint a flat and graded wash. Practice wet and dry brush blending techniques. Learn to feel the difference in texture and surface effects between oils and acrylics.

Water-Based Pigments

Introduction

Water-based pigments can be difficult to master, but they provide a solid foundation in technique that translates easily into other media. You cannot hide your mistakes in water media. For this reason, beginning painters should start with watercolor and progress through the other water media of gouache, casein, and eventually acrylics. For extended study in watercolor, review the works of Emil Nolde and Charles Demuth.

Water-based pigments

Water-based pigments or water media are pigments combined with a binder and diluted with water. You should use distilled water to dilute water-based pigments before application. Tap or impure water effects the clarity and permanence of water-based pigments.

Watercolors

Watercolors are pigments combined with gum arabic and diluted with water before application. Watercolors are available as powder, pan cakes, and tubes. Watercolors in powder or pancake form may require additional preparation before use such as grinding and mixing with a binder. Watercolor in a tube is ready to use. Tube color and some pan cakes are mixed with glycerin to retain moistness. Watercolors are water soluble when wet and dry.

Watercolor permanence

Watercolor pigments are classified by degrees of permanence based on research. Select a degree of permanence to suit your needs.

Permanence is designated according to this table:

Designator	Meaning
AA	A permanent, artist-grade quality paint.
A	A somewhat permanent, student-grade pigment.
B	A moderately permanent, cheaper, lower quality paint good for preliminary studies.
C	No significant degree of permanence, intended primarily for general public or classroom use.

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Water-Based Pigments, Continued

Watercolor characteristics

Watercolor is a transparent medium. Light reflects through the pigment from the paper surface. Watercolors look lighter when dry than wet, so mix pigments darker than required. You may also use watercolor as a translucent or as an opaque. Watercolor applied in thick layers creates cracks and is slow to dry. Painting layer over layer will muddy clarity. If you intend to paint one wash over another, allow the first wash to dry thoroughly before applying the second. Apply the second wash lightly and rapidly over the first to prevent picking up the pigment in the first wash.

Watercolor storage

Mixed watercolors may be kept in jars or in an enclosed palette with a damp sponge or paper towel inside to keep in moisture.

Figure 1-30 shows a palette with deep wells and a cover designed to keep pigments damp.

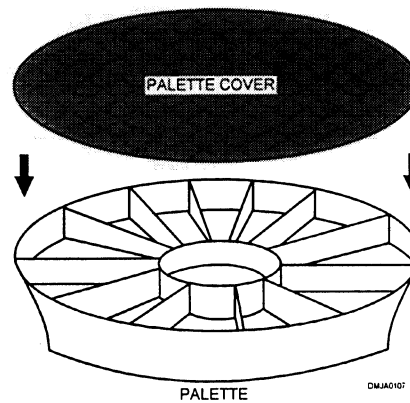


Figure 1-30.—A covered palette.

Watercolor finishing techniques

Watercolors have a matte surface. Watercolors do not require any special finishing techniques.

Gouache

Gouache is a form of opaque water media. Gouache may be dye or pigment, white paint and/or precipitated chalk suspended in a binder of gum arabic and diluted with water. When diluted and packaged in jars or tubes, it is also called tempura, show card color, or designer color.

Continued on next page

Water-Based Pigments, Continued

Gouache
permanence

Gouache is classified by degree of permanence, opacity, and staining properties based on tests and research. Select a degree of permanence that suits your needs.

Permanence is designated according to this table:

Designator	Meaning
A	A permanent artist-grade pigment.
B	A moderately permanent, student-grade pigment.
C	Nonpermanent pigment for general public or classroom use.

Opacity is designated according to this table:

Designator	Meaning
O	Opaque.
R	Reasonably opaque.
P	Partially transparent.
T	Transparent.

Staining properties are designated according to this table:

Designator	Meaning
N	Nonstaining and safe to wash over.
M	Moderately safe but, some dyes may bleed into an overwash.
S	Staining
SS	Strongly staining.

Continued on next page

Water-Based Pigments, Continued

Gouache characteristics	Gouache is opaque and chalky in appearance. Gouache should be applied in thin layers; otherwise, thick layers may become brittle and crack. Gouache is ideal for large areas of solid color and for small detail. Gouache in light colors dries darker than when wet. Gouache in dark colors lighten as it dries.
Gouache storage	You may store the gouache for short periods in an enclosed palette with a moist sponge or paper towel inside if you finish painting and have pigment left over. The moist sponge or paper towel will release moisture in the air allowing longer storage periods.
Gouache finishing	Gouache has a matte surface and does not require any special finishing techniques.
Casein	Casein is a water-based pigment made by combining a milk derived emulsion with oils, a stabilizer, and pigment. The formula for creating casein varies from manufacturer to manufacturer. Therefore, it is wise to select one brand of casein and use it exclusively.
Casein permanence	Casein is a relatively permanent pigment that is not rated by degrees of permanence. Casein is centuries old with only recent emulsion refinements.
Casein characteristics	Casein is not fluid like watercolor and gouache and not flexible like acrylics. Casein is water soluble when wet but, water proof when thoroughly dry. Casein is opaque with some amount of white added to each color. Casein is brittle and will crack when applied in thick layers.
Casein storage	Casein does not store well. Cheaper brands of casein lacking sufficient fungicides and stabilizers tend to mold and decompose. You should prepare the amount of casein you expect to use in one sitting. Clean your brush often during a painting session. Scrape excess paint from the palette and thoroughly clean the palette before putting it away.

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Water-Based Pigments, Continued

Casein finishing Paintings painted in casein have a matte or semi-matte surface finish. To achieve a light gloss on the surface of a casein painting, lightly rub the surface with a clean, dry, soft cotton ball.

Special equipment Special equipment used to create special effects consists of scraping tools, paper towels or sponges, toothbrushes, atomizers, salt, stencils, or masking fluids. Experiment with each of these tools.

SCRAPING TOOLS: Scraping tools remove pigment from the paper surface after you apply it. Scraping tools leave distinct marks according to the type of tool. Scraping tools include knife blades, razor blades, pins, nails, saw blades, palette knives, and fingernails.

PAPER TOWELS and SPONGES: Paper towels and sponges soak up excess pigment and water leaving images all their own. For an interesting effect, crumple a piece of paper, partially uncrumple it and dab it into the pigment on the paper surface.

TOOTHBRUSHES and MOUTH ATOMIZERS: You can create spackled effects of all intensities with a toothbrush or a mouth atomizer. To use an atomizer, place the straw end into a cup of pigment and blow into the mouthpiece.

Figure 1-31 shows a mouth atomizer.

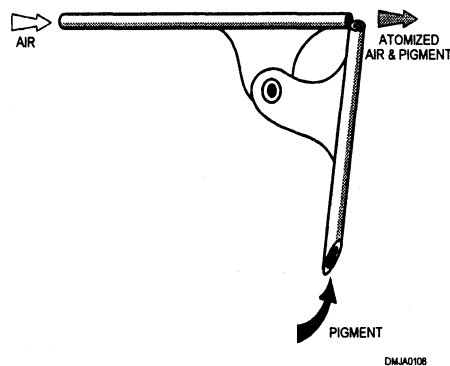


Figure 1-31.—A mouth atomizer.

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Water-Based Pigments, Continued

Special equipment (Continued)

SALT: Salt placed on the wet surface of a watercolor painting will repel pigment around it leaving a white spot difficult to create any other way. This is an especially effective technique for creating snow and sand.

STENCILS: Stencils placed on a painting surface will protect areas from receiving pigment. You can cut the edge of a stencil straight or jagged. For a softer edge, raise the stencil slightly from the paper surface.

MASKING FLUID: Liquid rubber cement or a commercially prepared liquid frisket protects areas you do not want to receive pigment. After the paint dries, the masking fluid can be removed by rubbing gently over the surface of the frisket until it releases or curls away.

Blending techniques

The two blending techniques are the wet-brush and the dry-brush method.

Wet brush blending

Wet brush blending uses water to blend water-based media. Apply the wet brush technique after you finish setting the flat tones on the subject.

To employ the wet brush blending technique, follow this table:

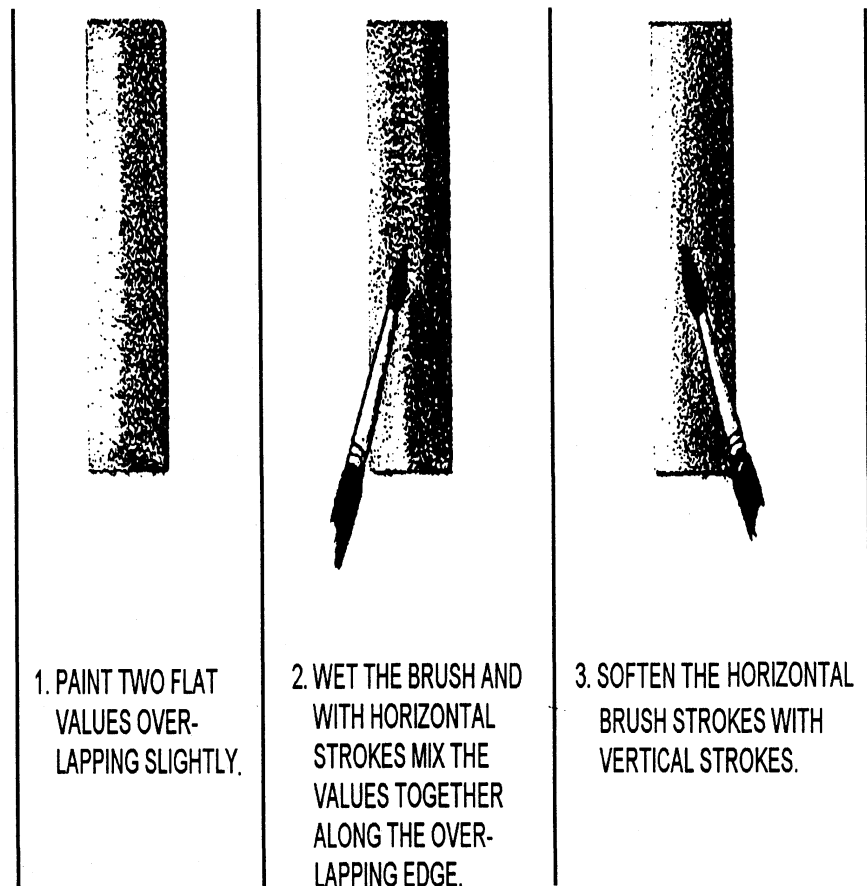
Step	Action
1	Set the flat tones of the subject.
2	Lay both selected values side-by-side, overlapping slightly.
3	Wet your brush in clear water.
4	Starting at the top, work your brush back and forth over the area where the values overlap.
5	Clean the brush and wet it slightly.
6	With vertical strokes, soften the previous horizontal strokes. Be careful to not lift the paint as you soften the strokes.

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Water-Based Pigments, Continued

Wet brush blending (Continued)

Figure 1-32 illustrates the wet brush blending technique.



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Figure 1-32.—Wet brush blending.

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Water-Based Pigments, Continued

Dry brush blending

Dry brush blending is another method of blending adjacent values, but this method uses a relatively dry brush.

To employ the dry brush blending technique, follow this table:

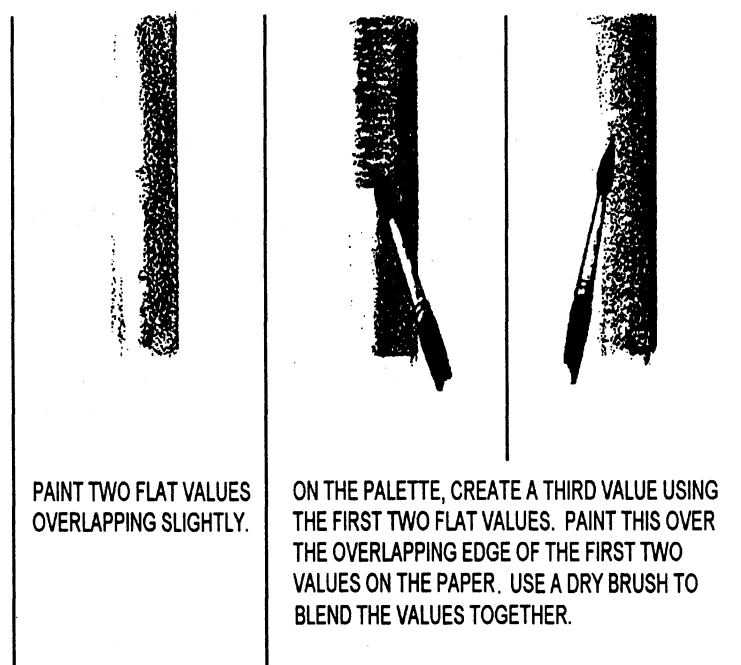
Step	Action
1	Set the flat tones of the subject.
2	Lay both values side-by-side, overlapping slightly.
3	Mix a third value halfway between the two values you are blending.
4	With your brush, pick up a small portion of the third value.
5	On a scrap sheet of paper, pallet the brush back and forth to remove a majority of the pigment. The brush bristles should be nearly dry with only pigment remaining.
6	Work the dry bristles over the area where the adjacent values overlap.
7	Slightly moisten the brush with water and vertically stroke over the previous strokes to soften the edges.

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Water-Based Pigment, Continued

Dry brush blending (Continued)

Figure 1-33 illustrates the dry brush blending technique.



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Figure 1-33.—Dry brush blending.

Exercises in water-based media

Only through practice will you master water-based pigments. But, once you are skilled in water media, mastering oils and acrylics should be easy. Prepare a work area with plenty of clean water and practice grade paper. Practice laying brush strokes of varying widths. Imitate surface texture with your brush. Lay a flat and graded wash. Set similar and widely differing tones side-by-side and develop your technique for wet and dry brush blending.

Summary

Review

This chapter covers the various media a Navy Illustrator Draftsman uses. You should understand the differences in drawing media, paper surfaces, lead hardness, and ink properties. Recognize the differences in oil-, acrylic-, and water-based pigments. Pigments apply, dry, and clean up differently. Pigments that have different bases will behave differently and, in turn, affect their presentation. Practice drawing and painting until you are fluent in the language of visual imagery.

Comments

There is always a market for the traditional skills of painting. You may be asked to paint signs or logos. You may also have to paint a mural. If this service is not asked of you and you are willing and capable, volunteer it. Your customer base will increase tenfold and extend well outside of your immediate command. You may enhance your career by increasing your skills and knowledge of all available media.
